

Waves, Sound, and Light:

Ch. 11.3 - 11.4

Ch. 12.1 - 12.3

Ch. 13.1 and 13.4

Ch. 14.1 and 14.3

Ch. 15.1 - 15.3

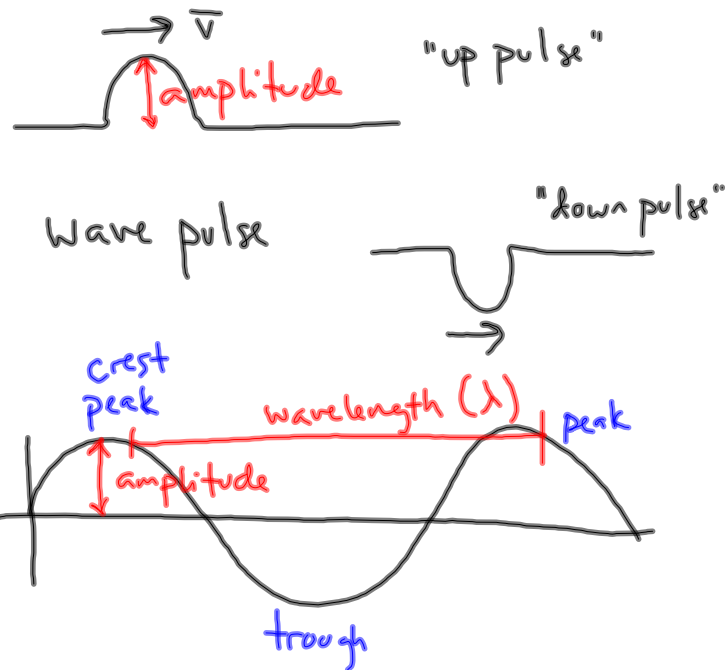
How are waves created?

- Vibrations of something
- Displacement
- Disturbance of particles in a space
- Cycle of the moon

Examples of things that create waves:

- Earthquake
- Speakers
- Electrons changing energy levels
- Vocal cords
- Wave pool → pumping water

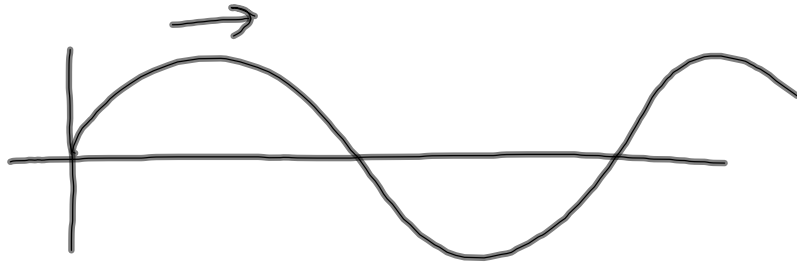
Wave Definitions:



- measure wavelength from same points (crest to crest, trough to trough, etc.)
- unit for wavelength is meters
- unit for amplitude is meters
- frequency \rightarrow measured in Hertz (Hz)
Hz = cycles/second
- Period (T) \rightarrow time it takes to complete one cycle
units are seconds

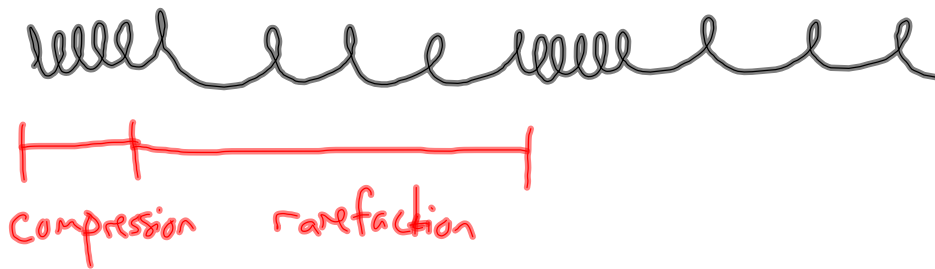
$$T = \frac{1}{f}$$

- Transverse Waves:



- amplitude \perp wave motion

- Longitudinal Wave:

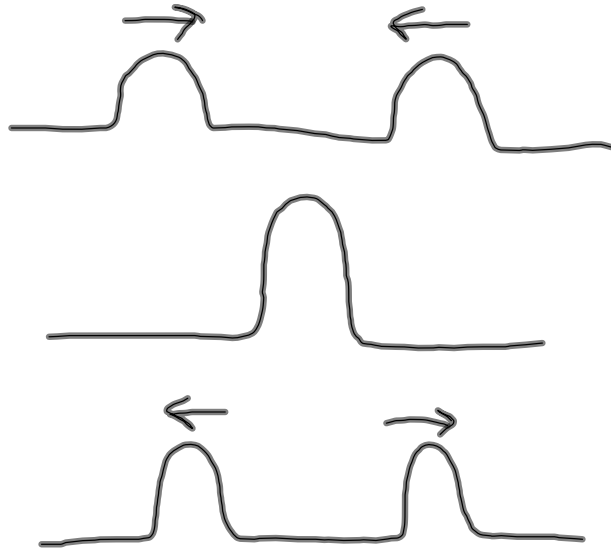


- Relationship between wave speed, wavelength, and frequency:

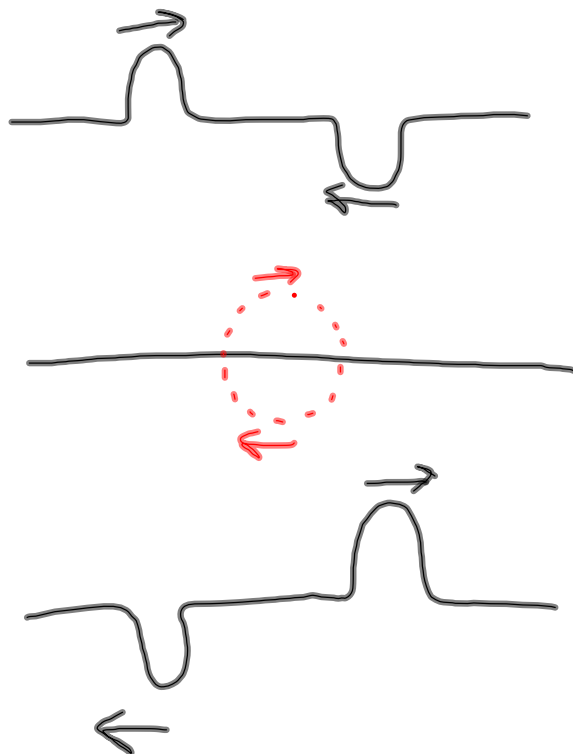
$$V = \lambda f = \frac{\lambda}{T}$$

Wave Combinations:

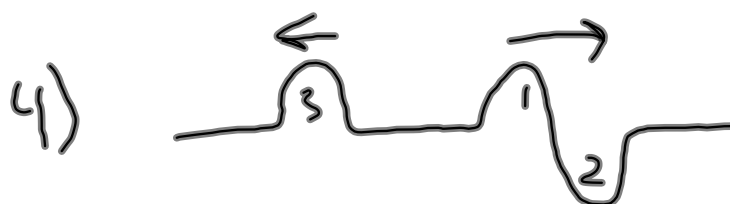
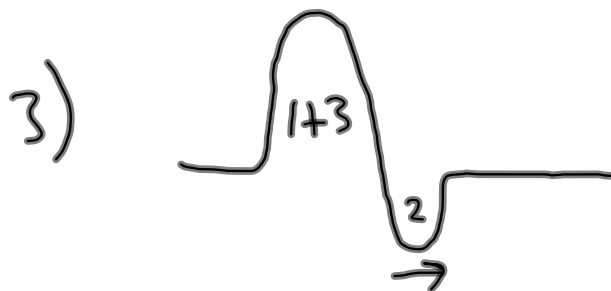
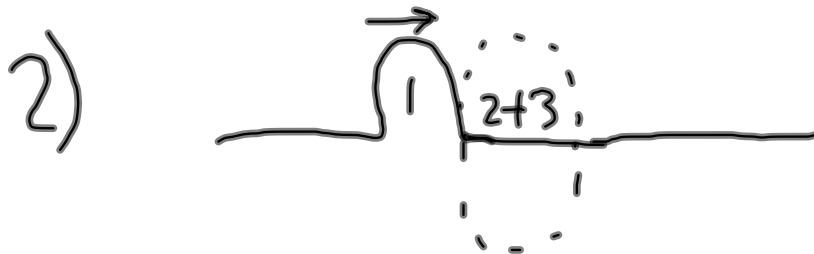
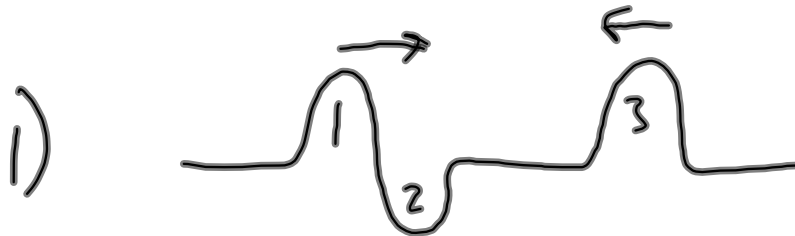
- Constructive Interference



- Destructive Interference:



Example 1:



Example 2:

